ISN'T IT A PITY ABOUT DIATOM DIVERSITY?

R. Jan Stevenson[1], Jason Zalack[1], and Julie Wolin[2]
[1]Center for Water Sciences, Department of Zoology, Michigan State University, East Lansing, Michigan 48864
[2]Department of Biological, Geological, and Environmental Sciences, Cleveland State University, Cleveland, Ohio

The United States Environmental Protection Agency conducted a nationwide assessment of the ecological conditions of lakes. Diatoms in the tops and bottoms of sediment cores, phytoplankton, water chemistry, as well as land use, climate, and geology of lake watersheds were determined for more than 1000 lakes using a probabilistic sampling design. Substantial changes in species composition and decreases in native species diversity were observed along the human disturbance gradient. Large scale decreases in native taxa and increases in invasive taxa were observed in lakes disturbed by humans as a result of shifts from species adapted to low nutrient concentrations to those requiring high nutrient concentrations for growth. In addition, these changes have the potential for substantial alterations in food web structure, such as the observed decreases in percent of chain forming diatoms and increases in percent of small unicellular diatoms with increasing human disturbance. In the National Lakes Assessment, the United States Environmental Protection Agency determined that 47% of US lakes were in good condition, 27% in fair condition, and 23% in poor condition. Based on simple assumptions about native species loss, we estimate that 50 and 75% of native taxa are not observed in fair and poor condition lakes. However, because of the assumptions that we make about relationships between observed and actual diversity, we cannot determine whether we have under or overestimated diversity loss, and how that varies with spatial scale. The pity is that we know so little quantitatively about threats, or lack of them, to diatom diversity.

ORAL PRESENTATION